KNOs: KNowledge acquisition, dissemination, and manipulation Objects

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↑ ABSTRACT

Most object-oriented systems lack two useful facilities: the ability of objects to migrate to new environments and the ability of objects to acquire new operations dynamically. This paper proposes Knos, an object-oriented environment that supports these actions. Knos' operations, data structures, and communication mechanisms are discussed. Knos objects "learn" by exporting and importing new or modified operations. The use of such objects as intellectual support tools is outlined. In particular, various applications involving cooperation, negotiation, and apprenticeship among objects are described.

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Note: OCR errors may be found in this Reference List extracted from the full text article. ACM has opted to expose the complete List rather than only correct and linked references.

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Charles J. Kacmar , John J. Leggett, PROXHY: a process-oriented extensible hypertext architecture, ACM Transactions on Information Systems (TOIS), v.9 n.4, p.399-419, Oct. 1991

↑ INDEX TERMS

Classification:

D. Software

↳ **D.1** PROGRAMMING TECHNIQUES

↳ **D.3** PROGRAMMING LANGUAGES

H. Information Systems

↳ **H.4** INFORMATION SYSTEMS APPLICATIONS

I. Computing Methodologies

↳ **I.2** ARTIFICIAL INTELLIGENCE

General Terms:

Algorithms, Design, Experimentation, Languages

↑ REVIEW

"Chidanand V. Apte"

This research paper discusses the use of KNOs (KNowledge acquisition, dissemination, and manipulation Objects) as an advanced, computer-based tool for the office environment. KNO objects manipulate knowledge fragments with their own rules and use this to negotiate, cooperate, and learn from other KNO objects. KNOs' object-oriented architecture provides autonomous, adaptable, and

concurrent behavior. The overall design is intended to support the dynamical abilities of objects to migrate to new environments and dynamically learn new operations. This paper basically is about the extension and application of object-oriented programming to office automation, and will be of interest to people working in these areas. The main drawback of this paper is that it is more of a research proposal and less of a research report. The hypothetical example of a KNOs-based system for handling transactions among multiple brokers and buyers of stock is interesting, but it provides inconclusive evidence of how KNOs' abilities contribute to significantly enhanced dynamic learning or cross-environment migration. It will certainly be worthwhile to read about the authors' experience with an implemented KNO and its application to office automation problems in a follow-up paper.
Online Computing Reviews Service

↑ **Collaborative Colleagues:**

E. Fiume: S. Gibbs, O. Nierstrasz, D. Tsichritzis

S. Gibbs: E. Bertino, E. Fiume, K. Morgan, R. L. Morris, O. Nierstrasz, F. Rabitti, D. Tsichritzis

O. Nierstrasz: E. Fiume, M. G. Fugini, S. Gibbs, B. Pernici, D. Tsichritzis

D. Tsichritzis: D. Badal, A. Cardenas, S. Christodoulakis, Starvos Christodoulakis, E. Fiume, S. Gibbs, J. Klebanoff, F. Lochovsky, P. Mantey, P. Martin, O. Nierstrasz, X. Pintado, F. Tompa

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belief near network and **stock** and **predict** and **classification** and **broker**

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22 Local and global structuring of computer mediated communication: developing linguistic perspectives on CSCW in cosmos
John Bowers, John Churcher
January 1988 **Proceedings of the 1988 ACM conference on Computer-supported cooperative work**
Full text available: pdf(1.88 MB) Additional Information: full citation, abstract, references, citings, index terms

This paper is concerned with the development of a language/action perspective in the Cosmos project. We emphasize the importance of seeing cooperative work in terms of participants' communicative actions. In contrast to some explorations of speech act theory, we argue that communicative actions should be seen as essentially embedded in dialogical contexts. In particular, we attempt to show the relevance of concepts derived from the analysis of actually occurring conversations, for computer ...

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Jessica Lin, Eamonn Keogh, Wagner Truppel
June 2003 **Proceedings of the 8th ACM SIGMOD workshop on Research issues in data mining and knowledge discovery**
Full text available: pdf(648.63 KB) Additional Information: full citation, abstract, references

Time series data is perhaps the most frequently encountered type of data examined by the data mining community. Clustering is perhaps the most frequently used data mining algorithm, being useful in it's own right as an exploratory technique, and also as a subroutine in more complex data mining algorithms such as rule discovery, indexing, summarization, anomaly detection, and classification. Given these two facts, it is hardly surprising that time series clustering has attracted much attention. T ...

Keywords: clustering, data mining, data streams, rule discovery, time series

25 Natural language processing for information assurance and security: an overview and implementations

Mikhail J. Atallah, Craig J. McDonough, Victor Raskin, Sergei Nirenburg

February 2001 **Proceedings of the 2000 workshop on New security paradigms**

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26 Semantic and schematic similarities between database objects: a context-based approach

Vipul Kashyap, Amit Sheth

December 1996 **The VLDB Journal — The International Journal on Very Large Data Bases**, Volume 5 Issue 4

Full text available: pdf(287.44 KB) Additional Information: full citation, abstract, citings, index terms

In a multidatabase system, schematic conflicts between two objects are usually of interest only when the objects have some semantic similarity. We use the concept of *semantic proximity*, which is essentially an *abstraction/mapping* between the domains of the two objects associated with the *context of comparison*. An explicit though partial context representation is proposed and the specificity relationship between contexts is defined. The contexts are organized as a meet semi-l ...

27 Workshop on recommender systems: algorithms and evaluation

Ian Soboroff, Charles Nicholas, Michael Pazzani

September 1999 **ACM SIGIR Forum**, Volume 33 Issue 1

Full text available: pdf(771.61 KB) Additional Information: full citation, index terms

28 Reference identification and reference identification failures

Bradley A. Goodman

October 1986 **Computational Linguistics**, Volume 12 Issue 4

Full text available: pdf(3.17 MB) Additional Information: full citation, abstract, references

Publisher Site

The goal of this work is the enrichment of human-machine interactions in a natural language environment. Because a speaker and listener cannot be assured to have the same beliefs, contexts, perceptions, backgrounds, or goals at each point in a conversation, difficulties and mistakes arise when a listener interprets a speaker's utterance. These mistakes can lead to various kinds of misunderstandings between speaker and listener, including reference failures or failure to understand the speaker's ...

29 The effects of systemic packet loss on aggregate TCP flows

Thomas J. Hacker, Brian D. Noble, Brian D. Athey

November 2002 **Proceedings of the 2002 ACM/IEEE conference on Supercomputing**

Full text available: pdf(375.56 KB) Additional Information: full citation, abstract, references, index terms

The use of parallel TCP connections to increase throughput for bulk transfers is common practice within the high performance computing community. However, the effectiveness, fairness, and efficiency of data transfers across parallel connections is unclear. This paper considers the impact of systemic non-congestion related packet loss on the effectiveness, fairness, and efficiency of parallel TCP transmissions. The results indicate that parallel connections are effective at increasing aggregate t ...

30 Design and evaluation of a conit-based continuous consistency model for replicated

services
Haifeng Yu, Amin Vahdat
August 2002 **ACM Transactions on Computer Systems (TOCS)**, Volume 20 Issue 3

Full text available: pdf(406.85 KB) Additional Information: full citation, abstract, references, citings, index terms

The tradeoffs between consistency, performance, and availability are well understood. Traditionally, however, designers of replicated systems have been forced to choose from either strong consistency guarantees or none at all. This paper explores the semantic space between traditional strong and optimistic consistency models for replicated services. We argue that an important class of applications can tolerate relaxed consistency, but benefit from bounding the maximum rate of inconsistent access ...

Keywords: Conit, consistency model, continuous consistency, network services, relaxed consistency, replication

31 Software engineering for mobility: a roadmap
Gruia-Catalin Roman, Gian Pietro Picco, Amy L. Murphy
May 2000 **Proceedings of the conference on The future of Software engineering**

Full text available: pdf(2.07 MB) Additional Information: full citation, references, citings, index terms

32 Early user---system interaction for database selection in massive domain-specific online environments
Jack G. Conrad, Joanne R. S. Claussen
January 2003 **ACM Transactions on Information Systems (TOIS)**, Volume 21 Issue 1

Full text available: pdf(845.54 KB) Additional Information: full citation, abstract, references, index terms

The continued growth of very large data environments such as Westlaw and Dialog, in addition to the World Wide Web, increases the importance of effective and efficient database selection and searching. Current research focuses largely on completely autonomous and automatic selection, searching, and results merging in distributed environments. This fully automatic approach has significant deficiencies, including reliance upon thresholds below which databases with relevant documents are not search ...

Keywords: Database selection, metadata for retrieval, structuring information to aid search and navigation, user interaction

33 A general, yet useful theory of information systems
Steven Alter
March 1999 **Communications of the AIS**

Full text available: pdf(190.54 KB) Additional Information: full citation, references, citings, index terms

34 Special issue on using large corpora: I: Structural ambiguity and lexical relations
Donald Hindle, Mats Rooth
March 1993 **Computational Linguistics**, Volume 19 Issue 1

Full text available: pdf(1.13 MB) Publisher Site Additional Information: full citation, abstract, references

We propose that many ambiguous prepositional phrase attachments can be resolved on the basis of the relative strength of association of the preposition with verbal and nominal heads, estimated on the basis of distribution in an automatically parsed corpus. This suggests that a distributional approach can provide an approximate solution to parsing problems that, in the worst case, call for complex reasoning.

35 SIGSAM BULLETIN: Computer algebra in the life sciences
Michael P. Barnett
December 2002 **ACM SIGSAM Bulletin**, Volume 36 Issue 4

Full text available: pdf(240.15 KB) Additional Information: full citation, abstract, references

This note (1) provides references to recent work that applies computer algebra (CA) to the life sciences, (2) cites literature that explains the biological background of each application, (3) states the mathematical methods that are used, (4) mentions the benefits of CA, and (5) suggests some topics for future work.

36 Parsing with flexibility, dynamic strategies, and idioms in mind
Oliviero Stock
March 1989 **Computational Linguistics**, Volume 15 Issue 1

Full text available: pdf(2.00 MB) Additional Information: full citation, abstract, references, citings
Publisher Site

One desirable aspect of a syntactic parser is being meaningful (i.e., contributing to incremental interpretation) during the process of parsing and not only at the end of it. This becomes even more important when dealing with flexible word order languages, where the number of alternatives in parsing may grow dangerously. One such parser is WEDNESDAY 2. It is a lexicon-based parser, relying on the chart mechanism combined with a particular kind of unification, guided by the so-called Principle of ...

37 Voice over IP: Intra-flow loss recovery and control for VoIP
Henning Sanneck, Nguyen Tuong Long Le, Adam Wolisz, Georg Carle
October 2001 **Proceedings of the ninth ACM international conference on Multimedia**

Full text available: pdf(1.05 MB) Additional Information: full citation, abstract, references, citings, index terms

"Best effort" packet-switched networks, like the Internet, do not offer a reliable transmission of packets to applications with real-time constraints such as voice. Thus, the loss of packets impairs the application-level utility. For voice this utility impairment is twofold: on one hand, even short bursts of lost packets may decrease significantly the ability of the receiver to conceal the packet loss and the speech signal playout is interrupted. On the other hand, some packets may be particular ...

Keywords: differentiated services, loss concealment, loss metrics, loss sensitivity, objective speech quality measurement, queue management, voice over IP

38 Markets and privacy
Kenneth C. Laudon
September 1996 **Communications of the ACM**, Volume 39 Issue 9

Full text available: pdf(231.63 KB) Additional Information: full citation, references, citings, index terms, review

39 Discovering Matrix Attachment Regions (MARs) in genomic databases
Gautam B. Singh
January 2000 **ACM SIGKDD Explorations Newsletter**, Volume 1 Issue 2

Full text available: pdf(738.57 KB) Additional Information: full citation, abstract, references

Lately, there has been considerable interest in applying Data Mining techniques to scientific and data analysis problems in bioinformatics. Data mining research is being fueled by novel application areas that are helping the development of newer applied algorithms in the field of bioinformatics, an emerging discipline representing the integration of biological and information sciences. This is a shift in paradigm from the earlier and the continuing data mining efforts in marketing research and s ...

Keywords: DNA Sequence Analysis, MARs, Matrix Attachment Regions, bioinformatics, data mining, gene therapy, medical data mining

40 Features: Coaching a society of robots in accomplishing joint tasks

Marc Perron

September 2002 **Crossroads**, Volume 9 Issue 1

Full text available: pdf(1.74 MB) Additional Information: full citation, references, index terms

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1 Contributed articles on online, interactive, and anytime data mining: MobiMine: monitoring the stock market from a PDA

Hillol Kargupta, Byung-Hoon Park, Sweta Pittie, Lei Liu, Deepali Kushraj, Kakali Sarkar
January 2002 **ACM SIGKDD Explorations Newsletter**, Volume 3 Issue 2

Full text available: pdf(1.16 MB) Additional Information: full citation, abstract, references

This paper describes an experimental mobile data mining system that allows intelligent monitoring of time-critical financial data from a hand-held PDA. It presents the overall system architecture and the philosophy behind the design. It explores one particular aspect of the system---automated construction of personalized focus area that calls for user's attention. This module works using data mining techniques. The paper describes the data mining component of the system that employs a novel Four ...

2 Special section on semantic web and data management: Agents, trust, and information access on the semantic web

Tim Finin, Anupam Joshi
December 2002 **ACM SIGMOD Record**, Volume 31 Issue 4

Full text available: pdf(585.01 KB) Additional Information: full citation, references

3 Launching the new era

Kazuhiro Fuchi, Robert Kowalski, Koichi Furukawa, Kazunori Ueda, Ken Kahn, Takashi Chikayama, Evan Tick
March 1993 **Communications of the ACM**, Volume 36 Issue 3

Full text available: pdf(3.45 MB) Additional Information: full citation, references, index terms, review

4 The evolution of the corporate IT function and the role of the CIO at Texaco: how do perceptions of IT's performance get formed?

Rudy Hirschheim, Jaana Porra, Michael S. Parks
November 2003 **ACM SIGMIS Database**, Volume 34 Issue 4

Full text available: pdf(372.21 KB) Additional Information: full citation, abstract, references, index terms

While senior management's confidence in the IT function and the CIO appears to be at an all time low, the field's understanding of why this condition exists is still confused. This paper suggests that the problem lies in how perceptions about IT are formed. To this end, the paper briefly looks at the growth and evolution of the corporate IT department at the oil giant Texaco, Inc. The analysis paints a somewhat disturbing picture of a top performing IT organization, intimately responsible for th ...

Keywords: IT function history, IT management, evolution of the CIO's role, evolution of the IT function, perception formulation, perception gap

5 Natural language question-answering systems: 1969
Robert F. Simmons
January 1970 **Communications of the ACM**, Volume 13 Issue 1
Full text available: pdf(2.15 MB) Additional Information: full citation, abstract, references, citings

Recent experiments in programming natural language question-answering systems are reviewed to summarize the methods that have been developed for syntactic, semantic, and logical analysis of English strings. It is concluded that at least minimally effective techniques have been devised for answering questions from natural language subsets in small scale experimental systems and that a useful paradigm has evolved to guide research efforts in the field. Current approaches to semantic analysis ...

Keywords: artificial intelligence, fact retrieval, language processing, natural language, question-answering system, semantics

6 Inventing the networked home: Sun, 3 Com, and other companies share their visions of the future at CES
Brent Butterworth
March 2000 **netWorker**, Volume 4 Issue 1
Full text available: pdf(1.56 MB) Additional Information: full citation, index terms

7 The role of computer networks in development
Larry Press
February 1996 **Communications of the ACM**, Volume 39 Issue 2
Full text available: pdf(330.41 KB) Additional Information: full citation, references, citings, index terms

8 Session summaries from the 17th symposium on operating systems principle (SOSP'99)
Jay Lepreau, Eric Eide
April 2000 **ACM SIGOPS Operating Systems Review**, Volume 34 Issue 2
Full text available: pdf(3.15 MB) Additional Information: full citation, index terms

9 Query evaluation techniques for large databases
Goetz Graefe
June 1993 **ACM Computing Surveys (CSUR)**, Volume 25 Issue 2
Full text available: pdf(9.37 MB) Additional Information: full citation, abstract, references, citings, index terms, review

Database management systems will continue to manage large data volumes. Thus, efficient algorithms for accessing and manipulating large sets and sequences will be required to provide acceptable performance. The advent of object-oriented and extensible database systems will not solve this problem. On the contrary, modern data models exacerbate the problem: In order to manipulate large sets of complex objects as efficiently as today's database systems manipulate simple records, query-processi ...

Keywords: complex query evaluation plans, dynamic query evaluation plans, extensible database systems, iterators, object-oriented database systems, operator model of

parallelization, parallel [redacted]gorithms, relational database systems, [redacted]t-matching algorithms, sort-hash duality

10 Agents, interactions, mobility and systems: The Agent-based Programming Language: APL

Chang-Hyun Jo, Allen J. Arnold
March 2002 **Proceedings of the 2002 ACM symposium on Applied computing**

Full text available: pdf(448.84 KB) Additional Information: full citation, abstract, references, index terms

Agent-based programming has been emerged as a new programming paradigm for the near future. There have been many research work in agent computing. However, the software engineering methodology and programming languages for agent computing are not yet sufficient and practical.This paper proposes a new programming language concept based on the BDI-agent model. The new concept has been prototyped by Agent-based Programming Language (APL). The prototype system for APL translates the APL source into ...

Keywords: agent-based computing, agent-based programming Language, agent-based software engineering, agents

11 Local and global structuring of computer mediated communication: developing linguistic perspectives on CSCW in cosmos

John Bowers, John Churcher
January 1988 **Proceedings of the 1988 ACM conference on Computer-supported cooperative work**

Full text available: pdf(1.88 MB) Additional Information: full citation, abstract, references, citings, index terms

This paper is concerned with the development of a language/action perspective in the Cosmos project. We emphasize the importance of seeing cooperative work in terms of participants' communicative actions. In contrast to some explorations of speech act theory, we argue that communicative actions should be seen as essentially embedded in dialogical contexts. In particular, we attempt to show the relevance of concepts derived from the analysis of actually occurring conversations, for computer ...

12 Rethinking the design of the Internet: the end-to-end arguments vs. the brave new world

Marjory S. Blumenthal, David D. Clark
August 2001 **ACM Transactions on Internet Technology (TOIT)**, Volume 1 Issue 1

Full text available: pdf(176.33 KB) Additional Information: full citation, abstract, references, citings, index terms

This article looks at the Internet and the changing set of requirements for the Internet as it becomes more commercial, more oriented toward the consumer, and used for a wider set of purposes. We discuss a set of principles that have guided the design of the Internet, called the end-to-end arguments, and we conclude that there is a risk that the range of new requirements now emerging could have the consequence of compromising the Internet's original design principles. Were ...

Keywords: ISP, Internet, end-to-end argument

13 Design and evaluation of a conit-based continuous consistency model for replicated services

Haifeng Yu, Amin Vahdat
August 2002 **ACM Transactions on Computer Systems (TOCS)**, Volume 20 Issue 3

Full text available: pdf(406.85 KB) Additional Information: full citation, abstract, references, citings, index terms

The tradeoffs between [redacted]sistency, performance, and availabilit[redacted]re well understood. Traditionally, however, designers of replicated systems have been forced to choose from either strong consistency guarantees or none at all. This paper explores the semantic space between traditional strong and optimistic consistency models for replicated services. We argue that an important class of applications can tolerate relaxed consistency, but benefit from bounding the maximum rate of inconsistent access ...

Keywords: Conit, consistency model, continuous consistency, network services, relaxed consistency, replication

14 IP multicast channels: EXPRESS support for large-scale single-source applications

Hugh W. Holbrook, David R. Cheriton

August 1999 **ACM SIGCOMM Computer Communication Review , Proceedings of the conference on Applications, technologies, architectures, and protocols for computer communication**, Volume 29 Issue 4

Full text available: pdf(1.66 MB) Additional Information: full citation, abstract, references, citings, index terms

In the IP multicast model, a set of hosts can be aggregated into a group of hosts with one address, to which any host can send. However, Internet TV, distance learning, file distribution and other emerging large-scale multicast applications strain the current realization of this model, which lacks a basis for charging, lacks access control, and is difficult to scale.This paper proposes an extension to IP multicast to support the *channel* model of multicast and describes a specific realizat ...

15 Fast detection of communication patterns in distributed executions

Thomas Kunz, Michiel F. H. Seuren

November 1997 **Proceedings of the 1997 conference of the Centre for Advanced Studies on Collaborative research**

Full text available: pdf(4.21 MB) Additional Information: full citation, abstract, references, index terms

Understanding distributed applications is a tedious and difficult task. Visualizations based on process-time diagrams are often used to obtain a better understanding of the execution of the application. The visualization tool we use is Poet, an event tracer developed at the University of Waterloo. However, these diagrams are often very complex and do not provide the user with the desired overview of the application. In our experience, such tools display repeated occurrences of non-trivial commun ...

16 Computer-based systems for cooperative work and group decision making

Kenneth L. Kraemer, John Leslie King

July 1988 **ACM Computing Surveys (CSUR)**, Volume 20 Issue 2

Full text available: pdf(3.56 MB) Additional Information: full citation, abstract, references, citings, index terms

Application of computer and communications technology to cooperative work and group decision making has grown out of three traditions: computer-based communications, computer:based information service provision, and computer-based decision support. This paper reviews the group decision support systems (GDSSs) that have been configured to meet the needs of groups at work, and evaluates the experience to date with such systems. Progress with GDSSs has proved to be slower than originally antic ...

17 Natural language processing for information assurance and security: an overview and implementations

Mikhail J. Atallah, Craig J. McDonough, Victor Raskin, Sergei Nirenburg

February 2001 **Proceedings of the 2000 workshop on New security paradigms**

Full text available: pdf(1.29 MB) Additional Information: full citation, references, citings, index terms

18 The effects of systemic packet loss on aggregate TCP flows
Thomas J. Hacker, Brian D. Noble, Brian D. Athey
November 2002 **Proceedings of the 2002 ACM/IEEE conference on Supercomputing**

Full text available: pdf(375.56 KB) Additional Information: full citation, abstract, references, index terms

The use of parallel TCP connections to increase throughput for bulk transfers is common practice within the high performance computing community. However, the effectiveness, fairness, and efficiency of data transfers across parallel connections is unclear. This paper considers the impact of systemic non-congestion related packet loss on the effectiveness, fairness, and efficiency of parallel TCP transmissions. The results indicate that parallel connections are effective at increasing aggregate t ...

19 Social Analyses of Computing: Theoretical Perspectives in Recent Empirical Research
Rob Kling
January 1980 **ACM Computing Surveys (CSUR)**, Volume 12 Issue 1

Full text available: pdf(3.98 MB) Additional Information: full citation, references, citings, index terms

20 A critique of common LISP
Rodney A. Brooks, Richard P. Gabriel
August 1984 **Proceedings of the 1984 ACM Symposium on LISP and functional programming**

Full text available: pdf(741.87 KB) Additional Information: full citation, abstract, references, citings, index terms

A major goal of the COMMON LISP committee was to define a Lisp language with sufficient power and generality that people would be happy to stay within its confines and thus write inherently transportable code. We argue that the resulting language definition is too large for many short-term and medium-term potential applications. In addition many parts of COMMON LISP cannot be implemented very efficiently on stock hardware. We further argue that the very generality of the design with its dif ...

Terms used
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1 Fast detection of communication patterns in distributed executions
Thomas Kunz, Michiel F. H. Seuren
November 1997 **Proceedings of the 1997 conference of the Centre for Advanced Studies on Collaborative research**
Full text available: pdf(4.21 MB) Additional Information: full citation, abstract, references, index terms

Understanding distributed applications is a tedious and difficult task. Visualizations based on process-time diagrams are often used to obtain a better understanding of the execution of the application. The visualization tool we use is Poet, an event tracer developed at the University of Waterloo. However, these diagrams are often very complex and do not provide the user with the desired overview of the application. In our experience, such tools display repeated occurrences of non-trivial commun ...

2 A model for notification systems evaluation—assessing user goals for multitasking activity
D. Scott McCrickard, C. M. Chewar, Jacob P. Somervell, Ali Ndiwalana
December 2003 **ACM Transactions on Computer-Human Interaction (TOCHI)**, Volume 10 Issue 4
Full text available: pdf(218.73 KB) Additional Information: full citation, abstract, references, index terms

Addressing the need to tailor usability evaluation methods (UEMs) and promote effective reuse of HCI knowledge for computing activities undertaken in divided-attention situations, we present the foundations of a unifying model that can guide evaluation efforts for notification systems. Often implemented as ubiquitous systems or within a small portion of the traditional desktop, notification systems typically deliver information of interest in a parallel, multitasking approach, extraneous or supp ...

Keywords: Peripheral systems, claims reuse, design model, usability

3 Information delivery systems: an exploration of Web pull and push technologies
Julie E. Kendall, Kenneth E. Kendall
April 1999 **Communications of the AIS**
Full text available: pdf(658.33 KB) Additional Information: full citation, references, citings, index terms

4 Contributed articles on online, interactive, and anytime data mining: MobiMine: monitoring the stock market from a PDA
Hillol Kargupta, Byung-Hoon Park, Sweta Pittie, Lei Liu, Deepali Kushraj, Kakali Sarkar
January 2002 **ACM SIGKDD Explorations Newsletter**, Volume 3 Issue 2

Full text available: pdf(1.16 MB) Additional Information: full citation, abstract, references

This paper describes an experimental mobile data mining system that allows intelligent monitoring of time-critical financial data from a hand-held PDA. It presents the overall system architecture and the philosophy behind the design. It explores one particular aspect of the system---automated construction of personalized focus area that calls for user's attention. This module works using data mining techniques. The paper describes the data mining component of the system that employs a novel Four ...

5 Computing curricula 2001

September 2001 **Journal on Educational Resources in Computing (JERIC)**

Full text available: pdf(613.63 KB) html(2.78 KB) Additional Information: full citation, references, citings, index terms

6 Natural language question-answering systems: 1969

Robert F. Simmons

January 1970 **Communications of the ACM**, Volume 13 Issue 1

Full text available: pdf(2.15 MB) Additional Information: full citation, abstract, references, citings

Recent experiments in programming natural language question-answering systems are reviewed to summarize the methods that have been developed for syntactic, semantic, and logical analysis of English strings. It is concluded that at least minimally effective techniques have been devised for answering questions from natural language subsets in small scale experimental systems and that a useful paradigm has evolved to guide research efforts in the field. Current approaches to semantic analysis ...

Keywords: artificial intelligence, fact retrieval, language processing, natural language, question-answering system, semantics

7 Illustrative risks to the public in the use of computer systems and related technology

Peter G. Neumann

January 1996 **ACM SIGSOFT Software Engineering Notes**, Volume 21 Issue 1

Full text available: pdf(2.54 MB) Additional Information: full citation

8 Launching the new era

Kazuhiro Fuchi, Robert Kowalski, Koichi Furukawa, Kazunori Ueda, Ken Kahn, Takashi Chikayama, Evan Tick

March 1993 **Communications of the ACM**, Volume 36 Issue 3

Full text available: pdf(3.45 MB) Additional Information: full citation, references, index terms, review

9 Process migration

September 2000 **ACM Computing Surveys (CSUR)**, Volume 32 Issue 3

Full text available: pdf(1.24 MB) Additional Information: full citation, abstract, references, citings, index terms, review

Process migration is the act of transferring a process between two machines. It enables dynamic load distribution, fault resilience, eased system administration, and data access locality. Despite these goals and ongoing research efforts, migration has not achieved widespread use. With the increasing deployment of distributed systems in general, and distributed operating systems in particular, process migration is again receiving more attention in both research and product development. As hi ...

Keywords: distributed operating systems, distributed systems, load distribution, process migration

10 Query evaluation techniques for large databases

Goetz Graefe

June 1993 **ACM Computing Surveys (CSUR)**, Volume 25 Issue 2

Full text available: pdf(9.37 MB) Additional Information: full citation, abstract, references, citings, index terms, review

Database management systems will continue to manage large data volumes. Thus, efficient algorithms for accessing and manipulating large sets and sequences will be required to provide acceptable performance. The advent of object-oriented and extensible database systems will not solve this problem. On the contrary, modern data models exacerbate the problem: In order to manipulate large sets of complex objects as efficiently as today's database systems manipulate simple records, query-processi ...

Keywords: complex query evaluation plans, dynamic query evaluation plans, extensible database systems, iterators, object-oriented database systems, operator model of parallelization, parallel algorithms, relational database systems, set-matching algorithms, sort-hash duality

11 Design and evaluation of a wide-area event notification service

August 2001 **ACM Transactions on Computer Systems (TOCS)**, Volume 19 Issue 3

Full text available: pdf(1.08 MB) Additional Information: full citation, abstract, references, citings, index terms, review

The components of a loosely coupled system are typically designed to operate by generating and responding to asynchronous events. An event notification service is an application-independent infrastructure that supports the construction of event-based systems, whereby generators of events publish event notifications to the infrastructure and consumers of events subscribe with the infrastructure to receive relevant notifications. The two primary services that should be provid ...

Keywords: content-based addressing and routing, event notification, publish/subscribe

12 Agents, interactions, mobility and systems: The Agent-based Programming Language: APL

Chang-Hyun Jo, Allen J. Arnold

March 2002 **Proceedings of the 2002 ACM symposium on Applied computing**

Full text available: pdf(448.84 KB) Additional Information: full citation, abstract, references, index terms

Agent-based programming has been emerged as a new programming paradigm for the near future. There have been many research work in agent computing. However, the software engineering methodology and programming languages for agent computing are not yet sufficient and practical.This paper proposes a new programming language concept based on the BDI-agent model. The new concept has been prototyped by Agent-based Programming Language (APL). The prototype system for APL translates the APL source into ...

Keywords: agent-based computing, agent-based programming Language, agent-based software engineering, agents

13 Web-enabled transformation of the brokerage industry

Clayton A. Looney, Debabroto Chatterjee

August 2002 **Communications of the ACM**, Volume 45 Issue 8

Full text available: pdf(112.61 KB) Additional Information: full citation, abstract, references, index terms

html(31 KB)

Understanding the strengths and limitations of emerging business models.

14 Session summaries from the 17th symposium on operating systems principle (SOSP'99)
Jay Lepreau, Eric Eide
April 2000 **ACM SIGOPS Operating Systems Review**, Volume 34 Issue 2
Full text available: pdf(3.15 MB) Additional Information: full citation, index terms

15 Complexity of finite-horizon Markov decision process problems
Martin Mundhenk, Judy Goldsmith, Christopher Lusena, Eric Allender
July 2000 **Journal of the ACM (JACM)**, Volume 47 Issue 4
Full text available: pdf(461.61 KB) Additional Information: full citation, abstract, references, citings, index terms

Controlled stochastic systems occur in science engineering, manufacturing, social sciences, and many other cntexts. If the systems is modeled as a Markov decision process (MDP) and will run ad infinitum, the optimal control policy can be computed in polynomial time using linear programming. The problems considered here assume that the time that the process will run is finite, and based on the size of the input. There are mny factors that compound the complexity of computin ...

Keywords: Markov decision processes, NP, NPPP, PL, PSPACE, computational complexity, partially observable Markov decision processes, succinct representations

16 Social Analyses of Computing: Theoretical Perspectives in Recent Empirical Research
Rob Kling
January 1980 **ACM Computing Surveys (CSUR)**, Volume 12 Issue 1
Full text available: pdf(3.98 MB) Additional Information: full citation, references, citings, index terms

17 The Dot Com Effect: the impact of e-commerce announcements on the market value of firms
Mani Subramani, Eric Walden
January 1999 **Proceeding of the 20th international conference on Information Systems**
Full text available: pdf(255.69 KB) Additional Information: full citation, references, citings, index terms

18 We Talk to Everybody
Marjorie Richardson, Jason Schumaker, David Penn
June 2000 **Linux Journal**
Full text available: html(96.53 KB) Additional Information: full citation, abstract, index terms

A quick look at some of the people who helped make Linux possible.

19 Computer-based systems for cooperative work and group decision making
Kenneth L. Kraemer, John Leslie King
July 1988 **ACM Computing Surveys (CSUR)**, Volume 20 Issue 2
Full text available: pdf(3.56 MB) Additional Information: full citation, abstract, references, citings, index terms

Application of computer and communications technology to cooperative work and group decision making has grown out of three traditions: computer-based communications,

computer:based inform[redacted]on service provision, and computer-ba[redacted]d decision support. This paper reviews the group decision support systems (GDSSs) that have been configured to meet the needs of groups at work, and evaluates the experience to date with such systems. Progress with GDSSs has proved to be slower than originally antic ...

20 Report on the 5th IFIP international workshop on quality of service (IWQOS'97)

Oguz Angin, Andrew T. Campbell, Lai-Tee Cheok, Raymond R-F Liao, Koon-Seng Lim, Klara Nahrstedt

July 1997 **ACM SIGCOMM Computer Communication Review**, Volume 27 Issue 3

Full text available: pdf(1.86 MB) Additional Information: full citation, abstract, index terms

This paper presents a summary of the fifth International Workshop on Quality of Service (IWQOS) which was held at Columbia University in May 1997. The goal of this three-day meeting was to foster interaction between researchers active in the area of Quality of Service(QOS) research, to reflect on past experiences and lessons learnt, and to discuss future QOS challenges. To reflect this goal, this year's workshop included a hot program made up of (i) a keynote address on "Programming Telecommunic ...

Terms used
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1 The implications of online investing
Prabhudev Konana, Nirup M. Menon, Sridhar Balasubramanian
January 2000 **Communications of the ACM**, Volume 43 Issue 1
Full text available: pdf(123.87 KB) html(37.58 KB) Additional Information: full citation, references, citings, index terms, review

2 The Dot Com Effect: the impact of e-commerce announcements on the market value of firms
Mani Subramani, Eric Walden
January 1999 **Proceeding of the 20th international conference on Information Systems**
Full text available: pdf(255.69 KB) Additional Information: full citation, references, citings, index terms

3 KNOs: KNowledge acquisition, dissemination, and manipulation Objects
D. Tsichritzis, E. Fiume, S. Gibbs, O. Nierstrasz
January 1987 **ACM Transactions on Information Systems (TOIS)**, Volume 5 Issue 1
Full text available: pdf(1.30 MB) Additional Information: full citation, abstract, references, citings, index terms, review

Most object-oriented systems lack two useful facilities: the ability of objects to migrate to new environments and the ability of objects to acquire new operations dynamically. This paper proposes Knos, an object-oriented environment that supports these actions. Knos' operations, data structures, and communication mechanisms are discussed. Knos objects "learn" by exporting and importing new or modified operations. The use of such objects as intellectual support tools is outlined ...

4 Fast detection of communication patterns in distributed executions
Thomas Kunz, Michiel F. H. Seuren
November 1997 **Proceedings of the 1997 conference of the Centre for Advanced Studies on Collaborative research**
Full text available: pdf(4.21 MB) Additional Information: full citation, abstract, references, index terms

Understanding distributed applications is a tedious and difficult task. Visualizations based on process-time diagrams are often used to obtain a better understanding of the execution of the application. The visualization tool we use is Poet, an event tracer developed at the University of Waterloo. However, these diagrams are often very complex and do not provide the user with the desired overview of the application. In our experience, such tools display repeated occurrences of non-trivial commun ...

5 An Internet multicast system for the stock market
August 2001 **ACM Transactions on Computer Systems (TOCS)**, Volume 19 Issue 3

Full text available: pdf(296.88 KB) Additional Information: full citation, abstract, references, index terms, review

We are moving toward an international, 24-hour, distributed, electronic stock exchange. The exchange will use the global Internet, or internet technology. This system is a natural application of multicast because there are a large number of receivers that should receive the same information simultaneously. The data requirements for the stock exchange are discussed. The current multicast protocols lack the reliability, fairness, and scalability needed in this application. We describe a distr ...

Keywords: multicast

6 In good company: how social capital makes organizations work
Donald J. Cohen, Laurence Prusak
January 2001 **Ubiquity**, Volume 1 Issue 42

Full text available: html(53.34 KB) Additional Information: full citation, index terms

7 Contributed articles on online, interactive, and anytime data mining: MobiMine: monitoring the stock market from a PDA
Hillol Kargupta, Byung-Hoon Park, Sweta Pittie, Lei Liu, Deepali Kushraj, Kakali Sarkar
January 2002 **ACM SIGKDD Explorations Newsletter**, Volume 3 Issue 2

Full text available: pdf(1.16 MB) Additional Information: full citation, abstract, references

This paper describes an experimental mobile data mining system that allows intelligent monitoring of time-critical financial data from a hand-held PDA. It presents the overall system architecture and the philosophy behind the design. It explores one particular aspect of the system---automated construction of personalized focus area that calls for user's attention. This module works using data mining techniques. The paper describes the data mining component of the system that employs a novel Four ...

8 Evaluation of strategic investments in information technology
Eric K. Clemons
January 1991 **Communications of the ACM**, Volume 34 Issue 1

Full text available: pdf(4.03 MB) Additional Information: full citation, references, citings, index terms, review

9 Switching cost and brand loyalty in electronic markets: evidence from on-line retail brokers
Pei-Yu Sharon Chen, Lorin M. Hitt
December 2000 **Proceedings of the twenty first international conference on Information systems**

Full text available: pdf(240.38 KB) Additional Information: full citation, references, index terms

Keywords: electronic markets, empirical research, financial sector, marketing, measures

10 Early user---system interaction for database selection in massive domain-specific online environments
Jack G. Conrad, Joanne R. S. Claussen
January 2003 **ACM Transactions on Information Systems (TOIS)**, Volume 21 Issue 1

Full text available: pdf(845 KB) Additional Information: full citation, abs, references, index terms

The continued growth of very large data environments such as Westlaw and Dialog, in addition to the World Wide Web, increases the importance of effective and efficient database selection and searching. Current research focuses largely on completely autonomous and automatic selection, searching, and results merging in distributed environments. This fully automatic approach has significant deficiencies, including reliance upon thresholds below which databases with relevant documents are not search ...

Keywords: Database selection, metadata for retrieval, structuring information to aid search and navigation, user interaction

11 An object-based programming model for shared data

Gail E. Kaiser, Brent Hailpern

April 1992 **ACM Transactions on Programming Languages and Systems (TOPLAS)**, Volume 14 Issue 2

Full text available: pdf(3.28 MB) Additional Information: full citation, abstract, references, index terms, review

The classical object model supports private data within objects and clean interfaces between objects, and by definition does not permit sharing of data among arbitrary objects. This is a problem for real-world applications, such as advanced financial services and integrated network management, where the same data logically belong to multiple objects and may be distributed over multiple nodes on the network. Rather than give up the advantages of encapsulated objects in modeling real-world en ...

Keywords: coordination language, daemons, financial applications, object-based, real-time, sharing

12 Computers and social change for quality long living: the Let's Connect Project

Robert V. Gallant

August 1990 **ACM SIGCAS Computers and Society , Proceedings of the conference on Computers and the quality of life**, Volume 20 Issue 3

Full text available: pdf(219.58 KB) Additional Information: full citation, references, index terms

13 Electronic futures markets versus floor trading: implications for interface design

Satu S. Parikh, Gerald L. Lohse

May 1995 **Proceedings of the SIGCHI conference on Human factors in computing systems**

Full text available: html(48.91 KB) Additional Information: full citation, references, citings, index terms

14 Vision & challenges: Global growth of open access networks: from warchalking and connection sharing to sustainable business

Roberto Battiti, Renato Lo Cigno, Fredrik Orava, Bjorn Pehrson

September 2003 **Proceedings of the 1st ACM international workshop on Wireless mobile applications and services on WLAN hotspots**

Full text available: pdf(226.85 KB) Additional Information: full citation, abstract, references, index terms

This paper discusses the evolution of W-LAN starting from the mere extension of LAN services indoors, through the widespread diffusion of outdoors coverage with free and often un-authorized access, to the business models supporting their evolution to public coverage HotSpots. Besides, the idea of Open Access Networks (OANs) going beyond wireless HotSpots to become a shared access infrastructure fostering service operators competition is introduced and discussed.The concept of Open Access Network ...

Keywords: 802.11, W[redacted] mobility, open access networks [redacted]

15 Partnerships in the U.S. telecommunications industry
Varun Grover, Pradeep Vaswani
February 2000 **Communications of the ACM**, Volume 43 Issue 2

Full text available: pdf(160.25 KB) html(48.40 KB) Additional Information: full citation, references, citings, index terms

16 Web-enabled transformation of the brokerage industry
Clayton A. Looney, Debabroto Chatterjee
August 2002 **Communications of the ACM**, Volume 45 Issue 8

Full text available: pdf(112.61 KB) html(31.60 KB) Additional Information: full citation, abstract, references, index terms

Understanding the strengths and limitations of emerging business models.

17 Design of a financial portal
Kemal Saatcioglu, Jan Stallaert, Andrew B. Whinston
June 2001 **Communications of the ACM**, Volume 44 Issue 6

Full text available: pdf(102.26 KB) html(33.42 KB) Additional Information: full citation, references, index terms

18 A comprehensive agent: mediated e-market framework
Nehemiah Mavetera, Armstrong Kadyamatimba
September 2003 **Proceedings of the 5th international conference on Electronic commerce**

Full text available: pdf(108.38 KB) Additional Information: full citation, abstract, references

This paper discusses an agent-mediated e-market framework. The framework highlights the different stages and components that require automation and are required for the implementation of a full e-market system using agent technology. Most of these e-market aspects have been discussed, prototypes developed into systems but they exist as separate entities lacking a common protocol for implementation. No attention has been paid to the problem of how e-market component systems can be integrated into ...

Keywords: E-commerce, E-market framework, brokering, negotiation, software agent mediation

19 Network connectivity for developing countries
George Sadowsky
August 1993 **Communications of the ACM**, Volume 36 Issue 8

Full text available: pdf(2.25 MB) Additional Information: full citation, references, citings, index terms

Keywords: international networking, socioeconomic microanalytic simulation

20 Markets and privacy
Kenneth C. Laudon
September 1996 **Communications of the ACM**, Volume 39 Issue 9

Full text available: pdf(231.63 KB) Additional Information: full citation, references, citings, index terms, review

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1 **Mining associated implication networks: computational intermarket analysis**
Tse, P.; Jiming Liu;
Data Mining, 2002. ICDM 2002. Proceedings. 2002 IEEE International Conference on , 9-12 Dec. 2002
Pages:689 - 692

[Abstract] [PDF Full-Text (338 KB)] **IEEE CNF**

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2 **Conceptualizing BDI agents for financial markets**
Fasli, M.;
Systems, Man, and Cybernetics, 2001 IEEE International Conference on , Volume: 2 , 7-10 Oct. 2001
Pages:829 - 834 vol.2

[Abstract] [PDF Full-Text (471 KB)] **IEEE CNF**

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3 **A hybrid approach to discover Bayesian networks from databases using evolutionary programming**
Man Leung Wong; Shing Yan Lee; Kwong Sak Leung;
Data Mining, 2002. ICDM 2002. Proceedings. 2002 IEEE International Conference on , 9-12 Dec. 2002
Pages:498 - 505

[Abstract] [PDF Full-Text (557 KB)] **IEEE CNF**

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4 **Adaptive behaviors of intelligent agents based on neural semantic knowledge**
Tinning Zhang; Covaci, S.;
Applications and the Internet, 2002. (SAINT 2002). Proceedings. 2002 Symposium on , 28 Jan.-1 Feb. 2002
Pages:92 - 99

[Abstract] [PDF Full-Text (303 KB)] **IEEE CNF**

5 **An adaptive multi-agent tool for electronic commerce**
Gleizes, M.-P.; Link-Pezet, J.; Glize, P.;
Enabling Technologies: Infrastructure for Collaborative Enterprises, 2000. (WET ICE 2000). Proeedings. IEEE 9th International Workshops on , 14-16 June 2000
Pages:59 - 66

[Abstract] [PDF Full-Text (972 KB)] **IEEE CNF**

6 **Tractable group detection on large link data sets**
Kubica, J.; Moore, A.; Schneider, J.;
Data Mining, 2003. ICDM 2003. Third IEEE International Conference on , 19-22 Nov. 2003
Pages:573 - 576

[Abstract] [PDF Full-Text (2138 KB)] **IEEE CNF**

Comparing Artificial Intelligence Systems for Stock Portfolio Selection

Extended Abstract

Chiu-Che Tseng
Texas A&M University – Commerce
P.O. BOX 3011
Commerce, Texas 75429
Tel: (903) 886-5497
Email: Chiu-Che_Tseng@tamu-commerce.edu

Abstract

The goal of an artificial intelligence decision support system is to provide the human user with an optimized decision recommendation when operating under uncertainty in complex environments. The particular focus of our discussion is the investment domain – the goal of investment decision-making is to select an optimal portfolio that satisfies the investor's objective, or, in other words, to maximize the investment returns under the constraints given by investors. The investment domain contains numerous and diverse information sources, such as expert opinions, news releases and economic figures, and so on. This presents the potential for better decision support, but poses the challenge of building a decision support agent for selecting, accessing, filtering, evaluating, incorporating information from different sources, and for making final investment recommendations. In this study we compare three most popular artificial intelligence systems for portfolio selection. We found that the artificial intelligence systems outperform human portfolio manager and market in 1997 and 2000.

Investment Problems

The investment domain, like many other domains, is a dynamically changing, stochastic and unpredictable environment. Take the stock market as an example; there are

more than two thousand stocks available from which portfolio manager or individual investor may select. This poses a problem of filtering all those available stocks to find the ones that are worth investment. There are also vast amounts of information available that will affect the market to some degree. All above is making extremely difficult for human portfolio manager to create the investment portfolio without relying on any tools.

Related Work

We explored the way to reduce the complexity of the investment decision deliberation that might cause the investor to lose money under urgent situations, and, at the same time, to provide the highest quality investment recommendations possible. .

For portfolio management, there is related work by Sycara, et al. [5] that focused on using distributed agents to manage investment portfolios. Their system deployed a group of agents with different functionality and coordinated them under case-based situations. They modeled the user, task and situation as different cases, so their system activated the distributed agents for information gathering, filtering and processing based on the given case. Their approach mainly focused on portfolio monitoring issues and has no mechanism to deal with uncertainty and urgency factors. Our system on the other hand reacts to the real-time market situation and gathers the relevant information as needed. Other related research on portfolio selection problems has received considerable attention in both financial and statistics literature [1, 2, 3, 4, 6].

Experiment Setting for Investment Portfolio Selection

In the experiments we ran, we selected three commonly use artificial intelligence systems – Bayesian network system, C5.0 Rule base system and a feed forward neural network system as illustrated in figure1. We selected eight financial ratio data from the S&P

500 companies as the input factors to all three systems. The training data is collected from the Compustat database from the period of 1987 to 1996. To test the performance, we used the date from 1997 and 2000 and let all three systems made the decision recommendation on which of the S&P 500 companies to be included in the investment portfolio.

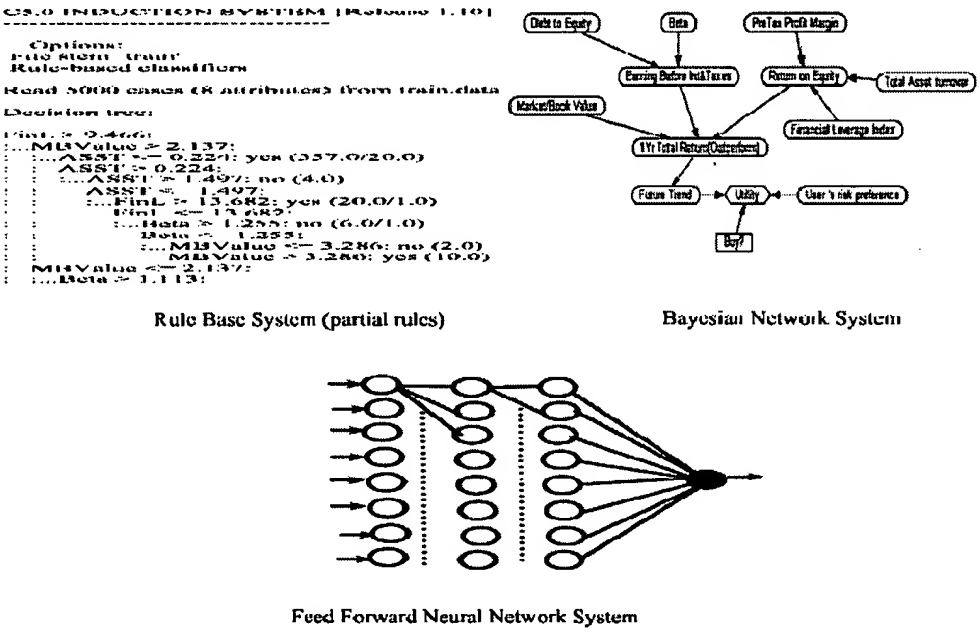

Figure 1. Three artificial intelligence systems for portfolio selection.

Experiment Result

We compared the performance of all three systems, Bayesian network, C5.0 and back-propagation neural network. We trained all three systems with the same training data and tested them with the same testing data. On the 1997 test data, Bayesian network system obtains its one year total return performance of 38.16154% when the portfolio contains the 156 selected companies. And the top 108 companies ranked by expected utility produce an

average one-year total return of 42.8264, almost twice the average of the S&P500's return and is better than the leading index fund Vanguard Index 500 which produced a 32% return for 1997.

The neural network failed to converge due to the large variation of the training data. The C5.0, the successor of the C4.5, did produce some interesting results. The C5.0 selected 218 out of the 500 companies and the average one-year total return for that portfolio is 38.90556. The C5.0 slightly outperformed the Bayesian network on 1997 data.

We also compared the performance of our system and the C5.0 using the data from year 2000 to demonstrate systems' performance in a modest year. The S&P 500 produced a negative return of –9% that year and the Vanguard index 500 fund were also in the negative territory of –8% return. Bayesian network system on the other hand produced a return of 12.23% and the C5.0 produced a return of 11.69%. In this case not only Bayesian network system outperform the market and the leading index fund, it also outperform the C5.0 algorithm.

Conclusion

We conducted some performance analysis with all three systems. We compared the two systems that was able to trained given the financial data – the Bayesian network and the C5.0 rule base system. Both systems outperform the leading mutual fund by a significant margin in 1997. We also ran the systems with the data from an under-perform year (2000); both the S&P 500 and the leading mutual fund produced a negative return for that year. Both systems on the other hand produced a positive return and outperforms the leading mutual fund and the S&P 500 index by a large margin.

Bayesian network system uses the influence diagram as the decision model; the structural information of the influence diagram plays an important role on the performance of

our system. We obtained the structural information from the domain expert and the information represents what the expert's opinion on the causal relationships among the nodes. From the experiment results we ran on an under-perform year, we can see that the Bayesian network system works better than C5.0 in a more general situation. This is due to the background information given by the domain expert when constructing the network.

Given the above analysis, we could conclude that by using a artificial intelligence system for portfolio selection has performance edge over the human portfolio manager and the market. The systems we selected for this study are only three among numerous artificial intelligence systems available. We would like to conduct further study to better qualify and quantify various artificial intelligence systems for use in the portfolio selection domain.

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[6] R. R. Trippi and J. K. Lee. Artificial Intelligence in Finance and Investing. Irwin, 1996.

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1 **Mining associated implication networks: computational intermarket analysis**
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2 **Conceptualizing BDI agents for financial markets**
Fasli, M.;
Systems, Man, and Cybernetics, 2001 IEEE International Conference on , Volume: 2 , 7-10 Oct. 2001
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such as planning, reasoning, problem solving, **decision** making and classification. Such uncertainty also
of creating information descriptors does not **support**ed by exact rules, consequently, the task to
Using **Bayesian Networks** as Retrieval Engines Maria Indrawan 1*
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Reasoning MPGE in Belief Networks with Applications to.. - Bon Sy Yanqiang (Correct)
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Y t g. In most realistic scenarios, from modeling **stock** prices to physiological data, the observations
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we may not be able to predict the exact price of a **stock** tomorrow, we may be able to predict its expected
http.cs.berkeley.edu/~murphyk/Papers/markov.ps.gz

Time Sensitive Sequential Myopic Information Gathering - Tseng, Gmytrasiewicz (Correct)
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this paper, we create a model to represent the **investment** scenario of a novice **stock** investor. By using
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Finally, to model the four cows in the live-**stock** we construct a class **Stock** that encapsulates the
on Fusion of Domain Knowledge with Data for **Decision Support**. Department of Computer Science Decision
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